

SCIENCE.—SUPPLEMENT.

FRIDAY, JANUARY 29, 1886.

PROFESSOR LADD ON THE YALE CURRICULUM.

WE presented in *Science* (vi. p. 499) a synopsis of Professor Palmer's article on recent changes at Harvard. We now give an abstract of an article from the same journal, the *Andover review*, on the question of electives, etc., at New Haven, by Professor Ladd of Yale.

The new education, as brought to our notice afresh by Professor Palmer, claims to have discovered that the methods of education in vogue for centuries have been radically wrong: it has organized a college on a wholly new basis.

But the proposed scheme, though revolutionary, and seeming to contradict experience, does not the less merit consideration. Before placing our faith in it, however, we ask, What experience can it boast? What trial has it had at Harvard? We answer, A trial for two years; for only during that short period have youths in the first half of their university course been placed completely under the elective system; and it is to this extension of the system that opposition is chiefly made. More than a generation is necessary to prove the final outcome of such great changes. Is, then, the experience of a single university, during but a moiety of its course, to be considered as sufficient?

But we shall be glad to examine the arguments so well presented and so courteously urged by Professor Palmer, and to compare the tabulated results of the new with those of the older method. Harvard has been chosen as the only thorough representative of the new education; and it is fitting that Yale should be selected to compare with it, partly because, as a teacher there, I am best acquainted with it; and partly because it is the leading representative of more conservative tendencies in education.

But let me first state some points in which I agree with Professor Palmer. I, too, hold that the world of science and learning has greatly progressed of late, and that both the matter and method of education must therefore also change. Sciences and modern languages must be taught, and the ancient classics take a relatively lower place than formerly. But all the best institutions recognize and act on these facts and truths. Within twenty-five years, Yale has made such

progress that much of its education may be styled 'new.' Then, again, along with Professor Palmer, I would measure the success of education by high ethical standards. But do the statistics given show that the new education uplifts character as no other training can? We think we can show that they go rather to prove the contrary. We shall, then, take up, in the order that commends itself to us, the various points adduced by Professor Palmer.

It is urged, that, under the new education, the student's ideal of a 'gentleman' has been enlarged and elevated. Hazing, and such practices, are no longer 'good form' at Harvard. We answer, that it is even so at Yale, where a marked improvement in these regards has been going on for the past twenty-five years. Of other institutions also, to a certain extent, the same is true. The causes of this improvement are not owing to any peculiar method of education, but to the gradual amelioration of customs due to a higher civilization; to the different attitude assumed by parents and teachers towards the young; to wiser dealings with students on the part of college faculties; and, lastly, to the influence of well-regulated athletic sports in giving an outlet for the surplus vitality of the youth.

But it is claimed that the new education is very popular. The growth of Harvard under it has been very great, both in numbers and resources. But, we ask, has it received these generous gifts as tokens of approval of the elective system? Have not other colleges also received very bountiful gifts? During the last fourteen years, Yale has received, either from gifts or by bequest, more than two and a half millions, while its library has increased by eighty-three thousand volumes. Though this sum does not equal that received by Harvard during the same time, yet it tends to throw doubt on the prestige of the new education with the long purses of the country.

The increase of students certainly does show popular favor. We admit that the new education would be likely to be popular with youths of eighteen. But Yale, too, shows remarkable growth during the past twenty-five years. The average number of undergraduates has been as follows: 1861-65, 533; 1866-70, 610; 1871-75, 704; 1876-80, 745; 1880-84, 792. Besides, no other college has rejected so large a per cent of candidates for admission, or sent away so many for failing to keep up to its standard of scholarship.

We find, too, from the last statistics, that more than 55 per cent of the students at Harvard were from the state in which it is situated, while less than 32 per cent of the Yale undergraduates are from Connecticut. The new education is, at all events, not yet cosmopolitan.

Let us next compare Harvard and Yale in the very important point of attendance at college recitations, etc. Professor Palmer thinks it creditable to the members of the last senior class at Harvard that they 'had cared to stay away' at only 16 per cent of all the recitations. At Yale this term, for the seven weeks for which the record is complete, the freshman class showed but 3.7 per cent of absences. In this record are counted absences from all causes whatsoever: it includes the absence of one student through sickness for forty-eight days. The absences in the sophomore class were but a little more than 3.3 per cent. Moreover, all tardiness at a recitation beyond five minutes, and all egresses, count as absences; as does also presence at a recitation, while wishing to be excused from answering. Freshmen and sophomores are allowed but six absences during a term, to cover all such causes as sports, attention to friends, etc.; and yet they did not avail themselves of more than three-fourths of these absences. The junior and senior classes, which are allowed eight absences in a term, showed, during the period of seven weeks, an irregularity of 5.5 and 6 per cent respectively. We may add that the showing for the whole term would probably be better than for the first seven weeks of it.

We see, then, that the irregularity of the Harvard student is from a little less than three to five times as great as that of the average Yale student. The difference is surely very significant as showing the working of the two systems.

Alluding to the "charge of 'soft' courses," "which," he says, "is one of the stock objections to the elective system," Professor Palmer shows us what wise courses the juniors and seniors of Harvard choose. I regret that we are not told how the freshmen exercise their right of option. So far as I can judge, the choices of the Yale juniors and seniors display more taste for hard work than is the result under the new system. No course in classics or in the higher mathematics was a favorite with the two upper classes at Harvard in 1883-84, while 54 juniors and 181 seniors are reported in 'fine arts,' for this year. At Yale this term, however, 53 choices of courses in higher mathematics, and 179 in classics, have been made. The student who has been at regular hard work during his first two years, will be likely to enjoy it in his last two.

Another excellency ascribed by Professor Palmer to the new education is, that under its influence the standard of 'decent scholarship' is steadily rising. To prove this, he cites the marks received by the average Harvard student during the different years since 1874-75. We frankly state that we think such a criterion most unreliable. The students' marks are higher under the elective system, but largely because the teacher, as well as the pupil, is known by his marks; and many students choose their elective because of this fact. Under that system it would be a better test of a pupil's real merits to inquire what courses he takes under teachers that give hard work and low marks.

The new education is also credited with having effected an improvement in the spirit and work of the instructors themselves. We accept Professor Palmer's testimony as conclusive on this point. But in other colleges besides Harvard are to be found the spirit and method which he justly praises; and without them no one should be an instructor under any system. May not, also, a method that makes so much depend on the favor of those taught, develop methods of instruction not conducive to the highest efficiency?

I may remark here that I cannot share the personal experience of Professor Palmer, when he, on looking back upon his college days, feels that more than half of his studies should have been different. My studies at college were wholly prescribed, but they have been none the less of use to me on that account. They have taught me to work hard, and to do patiently every task set before me; and this I would not give for all to be gained from the elective courses of either Harvard or Yale.

But the real matter of disagreement between Professor Palmer and myself is, "why the elective system should be begun as early as the freshman year." This, he says, lack of room precludes him from discussing; adding, "and it hardly needs proving." But here, in my opinion, he is wrong. Yale, with many other colleges, allows much choice to students in their last two years; juniors elect eight-fifteenths, and seniors four-fifths, of their studies. No choice, except that between French and German, is permitted in the first two years. Why, then, am I opposed to the extension given to the elective system at Harvard? Why draw the line between sophomores and juniors, rather than at the entrance upon the freshman year? Why prescribe any courses for the last two years?

The question is simply one of drawing lines. We think, that, after two years' drill at college, the youth can more wisely select his studies than at entrance. Professor Palmer thinks that the

choice should be made all at once, and that at the time when the boy leaves home; that from that time onward he should have the entire decision. We hold, on the contrary, that he should first develop somewhat in his new surroundings, learn better how to study, and what the different courses are, before he has the grave task of deciding. Moreover, a headlong plunge into freedom is not a good thing. I still think, also, that an educated man should enjoy a good training in the five great branches of human knowledge, — in mathematics; in language, including literature; in physical science; in the history of his race; in philosophy. Because, then, I do not think that the new education draws the line in the right place, I am opposed to its extreme measures.

One argument of Professor Palmer hardly admits of statistics. He thinks the type of manliness at Harvard higher than that to be found at colleges that have not so fully adopted the elective system. I reply, that I do not believe the men at Yale yield in manliness to those of any college.

My ideal of cultured manliness in the undergraduate agrees with that of Professor Palmer: as to how best to realize it, we differ. In my opinion, he gives too little weight to the great ethical law of habit, and to the value of the pressure of immediate necessity. We want to train the young to choose right spontaneously, but none of us live solely under the influence of high and remote ideals. Under a system of education, which kindly but firmly invites men to 'choose right,' in view of consequences that come closely home to them, the best characters will be formed.

Having now pretty fully traversed the ground of Professor Palmer's arguments from experience, I wish, in closing, to express, on behalf of the majority of educationists, the fears — honest and strong fears — which they feel as to the ultimate results of the new education.

We fear that the new education will increase the tendency to shallowness, already great enough in American student life. We have already too much smattering of many knowledges. The chief remedy must be to pursue certain topics with persistence and thoroughness. If the average American boy, on entering college, had had the discipline afforded by the drill of a German gymnasium, he might more safely judge for himself. Two years more of continued study of certain prescribed subjects — whatever these may be — is certainly little enough to require of him.

We are afraid of the effects of the new education on the academies of the country. They have been gradually improving under the increased requirements of the colleges; but how shall they meet the demands made by boys, who, under the

new education, may enter college in so many different ways? What interest, also, will boys take in mathematics and the ancient classics, when these are liable to be abandoned so soon as they have attained free election?

We are afraid of the effects of the new education on the higher education of the country, which has been constantly rising for years. The new methods, in themselves considered, are better than the old: and the new learning and science are, of course, far richer than those of the past. But, in order to introduce these, is it necessary to take the direct control from the older and wiser, and leave it to the choice of the inexperienced? Such a course will, in certain lines, destroy all connected and steady discipline in higher education.

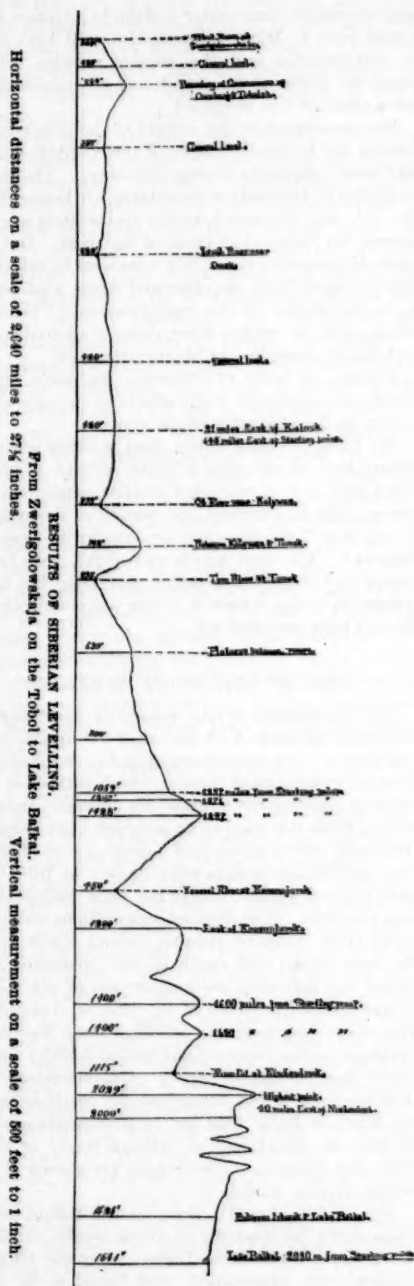
Finally, in spite of Professor Palmer's arguments, we are afraid of the effects of the new education on the character of the youth.

We think we have shown, that in every respect, except that of securing \$175,000 instead of \$250,000 a year, and of making a smaller percentage of annual gain in numbers, the results of the system in vogue at Yale are equal or superior to those at Harvard. We need much more light, both from reason and observation, before preferring the new education to one which is, in our judgment, wiser, though both new and old.

THE LEVELLING OF SIBERIA.

THE publication of the results of the Siberian levelling, the largest of the kind yet made, is at last ended. The survey originated in the Imperial Russian geographical society, which petitioned the Russian government to grant the necessary means, setting forth the want of an accurate knowledge of the height above sea-level of a great part of Siberia. The preliminary results were known in 1878, and gave a much greater height for Lake Baikal than was expected. The detailed calculations were delayed from different reasons, among which were the long illness and death of Mr. Moschkow, to whom was intrusted the greater part of the work. It was afterwards given to W. Fuss, who ended it. The whole length of the levelling from Zwerigolowskaja on the Tobol to Lake Baikal is 3087.1 versts (2,040 English statute miles). Unfortunately the starting-point is not connected by levelling with the Black or Baltic seas, but by triangulation only, so that an uncertainty of perhaps thirty or even forty feet remains. The results are shown in the accompanying profile.

Gen. A. Tillo has the direction of different levelings under the ministry of public works. In 1884 the mean level of Lake Ladoga over the Gulf of Finland was determined, and found to be 16.3



English feet, while the formerly admitted height was 66 feet. Such a great difference from the formerly admitted height is startling, yet the new figures are the result of so accurate and well-checked operations and calculations that their result cannot be doubted. According to the new determination, the slope of the Neva is about the same as that of the Volga in its middle course, while the formerly admitted heights made it four times greater. To have another check on the height of Lake Ladoga, the barometric means of H. Schlusberg were compared with those of St. Petersburg for a mean of eight years. The difference of level of the Ladoga and Gulf of Finland, determined barometrically, is but 8.6 feet; that is, less by 7.7 feet than that determined by levelling. If we suppose both series of observations to be equally accurate, and the instrumental error determined with the greatest precision, this would prove that the mean pressure rises toward the east, — a result quite consistent with the general course of the isobars in Russia; but the difference is rather too large for so small a distance.

Lakes Husen and Onega have also been levelled, and the figures for them will shortly be published. Their height was also found to be smaller than formerly admitted.

A. WOEIKOF.

POPULAR PSYCHOLOGY.

SOCRATES, Cicero tells us, called down philosophy from heaven to earth, and introduced it into the cities and houses of men. In each stage of the development of a science an essential step is the diffusion of the general tendencies and results obtained amongst the intelligent public. Nowadays, when each branch of study must make good its claim to a place on the curriculum, it is more than ever necessary to acquaint the cultured and powerful public with the general problems and broad outlines of your science. Thus it has come about that a certain class of scientific men have almost made themselves specialists on the topic of popular science. It is largely to them that the public looks for their scientific enlightenment. A larger and more important class of popular scientists, very fortunately, are the masters of science themselves. When such men as Huxley and Helmholtz prepare with their own hands the scientific food for the public mind, there really must be an inadequate power of reception of such knowledge, if a healthful, wide-spread activity in science is not the result.

Psychology, since it has received the impulse which has made 'physiological psychology' a common description of it, has made sufficient

progress to be able now to give in a popular dress an account of its aims, its problems, its methods, and its results. It is fortunate that Professor Wundt, whose name perhaps, more than that of any other person, has become associated with this modern movement, has given his time to a more or less popular exposition¹ of a few departments of this diffuse subject. The development of experimental psychology has been such a rapid one, that already one must be a specialist in one department of it. To some extent Professor Wundt has confined his essays to an account of work done in his own laboratory, while another portion of the book presents views upon those general problems, interesting to every generation of mankind, which seem to him most adequate and scientific.

In an essay on the problems of experimental psychology, he contrasts the method of this science with that of metaphysics, with which it is historically closely connected, and defends it from the attacks and prejudices of its opponents. On the one hand, the metaphysicians raise the cry that it is only 'crude empiricism,' a mere attention to natural phenomena, a lower field of work, perhaps good enough for those who are willing to enroll themselves in such a cause; while the nobler, higher flights of pure philosophy, where every problem finds its solution worked out with a wonderful ease and regularity, are widely open to him. On the other hand, the exact scientists regard this new aspirant for a place amongst the sciences with a suspicious distrust of the justness of its claim. The best answer to the first is to prove to him that many of the problems discussed, *pro* and *con*, by various metaphysical schools, can be brought into the laboratory and solved there with the aid of suitably devised apparatus. The answer to the latter will be a demonstration that within natural limits the same regularity and predictability that characterizes his own work, also holds in experimental psychology. In other words, it is the 'measurement of psychic processes' (the subject of the next essay) that forms one of the main problems.

The beginning of all culture is a clock. Where the conditions of life are so primitive that a time standard is unnecessary, there can be little mental development. For measuring time, man need not invent an apparatus, but has only to learn to tell time on the world-clock, the movements of the heavenly bodies. But it is to be noted that time, though objectively measured, is really a psychic process; for our perception of time is not changed when the clock stops, but is changed when we fall asleep. One by one the measurements of physical

phenomena are required, and last comes the utilization of these physical measurements for measuring the psychic processes. The first time sense is the flow of sense impressions; the last step is to turn back and measure these impressions. Some sort of philosophy or psychology appears early in history; then come the great advances of physics; in the last stage, a psycho-physics.

Perhaps it is only a coincidence that it really was a branch of physical science, astronomy, that performed the first experiment which led to the long series of studies of psychic time. Even a martyr can be pointed out in this cause; for it is told that an observer at Greenwich, whose observations were unusually slow, was often boxed on the ears for this peculiarity, and afterwards discharged. Twenty years later Bessel saved the honor of our martyr by pointing out that each person had a 'personal equation' of his own; that it took an appreciable time to record an observation after it was made, which time differed in different individuals. If we were asked to press a key as soon as we saw an expected flash of light, it would seem to us that the reaction was instantaneous. But still ordinarily it takes from an eighth to a sixth of a second. About a half to a tenth of a second is taken up in central brain processes, while the rest is used in conducting the impression to and from the brain. If, instead of reacting when we saw the light, it was agreed that the reaction should take place only after the color of the light had been perceived, the additional time necessary for perceiving this color might be called the 'distinction' time, and would vary from a twentieth to a fiftieth of a second. In this way the time necessary for hearing syllables, words, seeing colors, figures, pictures, letters, and so on, and understanding them, is open to measurement, and the relative time required for these operations marks their complexity. Again: we can agree, that, if you see a blue light, you are to react with the right hand; if a red, with the left. Here is, first, the time for perceiving a light already measured, then the time to distinguish its blueness or redness, also measured, and then the 'choice' time necessary for selecting the appropriate hand for the color seen. This last psychic process takes about as long as the 'distinction' time. Of course, it depends on the number of reactions from which the choice is to be made. If it is one of two, the time would be a tenth of a second; if one of ten (say, the ten fingers), the time would be half a second. A rather curious result of these observations is, that it takes almost as long to perceive a single letter as it does to perceive a one- or two-syllable word, which shows that the word is perceived as a whole, not as a combination of letters, — that it is

¹ *Essays*. By W. WUNDT. Leipzig, Engelmann, 1885.

the psychic unit. The next step takes us still further into the nature of mind by measuring the time necessary for one idea to call up another related to it in any way,—‘association time.’ This process is evidently a more complicated one, a higher function, and takes a longer time, about half to three-fourths of a second. Individual differences are very great here, and we are at the beginning of those mental qualities which in their extremes distinguish the genius from the dullard. Not only the time, but the kind of association, is characteristic of the individual. The direction of one’s associations is as good a clew to his character as can readily be gotten. If we limit the subject to one kind of association, for instance, what the logicians call ‘subsumation’ (that is, for example, if the word is ‘horse,’ the associated word must include horse as ‘quadruped,’ ‘animal’), the time is longer by about a tenth of a second than unrestricted association time.

Another very curious result which was wrought out in Professor Wundt’s laboratory is the peculiar effect of attention, which actually makes you hear or see a thing before the thing is there to be heard or seen. If you are to observe opposite what stroke of a graduated circle an indicator attached to a pendulum is swinging when a bell strikes, then, after the interval between the beginning of the swing and the ringing of the bell has become fixed in your mind, you will anticipate the stroke of the bell, and make it ring a fraction of a second before it really sounds. But a further discussion of this question would carry us too far. It has been shown, that, compared with such motions as light, sound, or electricity, nerve-conduction is slow, and those nerve processes associated with the more complex sensations and perceptions very slow indeed; that by measuring these times we will obtain a graded scale of the complexity of some of the simpler mental processes, and gain a deeper insight into their nature.

This essay has been selected because it represents, perhaps, the more strictly original part of the book better than any other. Most of the others are inspired by new points of view, as, for example, the one on language, which takes its basis from the observations on the development of language in children and deaf-mutes.

From the English side comes an attempt to give in a popular form the results of studying the insane and deranged as far as such study bears on certain peculiar historical and psychological facts.¹ One general topic in which the author is deeply interested is the hallucinations of eminent historical characters. The list of these is so strikingly

large, if one is willing to take into account very small deviations in mental soundness, that it has led to the thesis (old as Aristotle) that genius and insanity are closely allied. But the cases treated by Dr. Ireland are only those in which this hallucination gave character and motive to the life of the individual. The peculiar mental condition of Mohammed, Swedenborg, and Joan of Arc, are graphically and instructively presented: they form a welcome contribution to the psychology of greatness. In this connection may be mentioned a work on genius,¹ recently published, which, though it makes no claims to be, and is not, a scientific book, touches with a somewhat literary motive on this topic. The writer has made a strong statement of the vanities of eminent men; not of men of genius, however, in any proper sense.

Another peculiar malady which the flesh of the great is heir to, is the ‘insanity of power.’ The proposition is, that persons in positions in which all their wishes and whims can be put into deeds at once, are liable to become intoxicated with this omnipotence, and to indulge in morbid and cruel practices. The horrible spectacles which the reign of the Claudian-Julian family of emperors at Rome, reaching the climax in Nero, presented to the world, shows the terrible force of this disease, and its hereditary nature. The reigns of Ivan the Terrible in Russia, and of Mohammed Toghluks in India, are other examples of the debasing effects of unchecked power, while the hereditary neurosis of the royal family of Spain illustrates the special dangers to which these select families are subject.

Another line of interest with Dr. Ireland is the study of the relation of the two sides of the body. As the main motor nerves cross from the brain to the opposite side, we are right-handed and left-headed. This predominance of the left hemisphere of the brain is an indication that the two hemispheres only in part are one, and in part are two. Have we one brain or two brains? is, then, not at all an unnecessary question. The peculiar phenomenon of mirror-writing (i.e., of writing from right to left, so that when reflected in a mirror it appears normal), which appears in children and some forms of insanity, has attracted notice to this question. The results as yet are not very definite. Other psychological curiosities, such as sympathetic insanity, which makes whole families go insane at once, peculiar fixed ideas, and so on, are treated in a popular way. The book will not say much that is new, but gives in a very readable form an interesting account of some of the modern phases of psychological thought. J. J.

¹ *The blot on the brain: studies in history and psychology.* By W. W. IRELAND, M.D. New York, Putnam, 1886.

¹ *Insanity and vanity of genius.* By KATE SANBORN. New York, 1886.

IRON CONFERENCE AT ST. PETERSBURG.

THE meetings of the Russian iron and coal trades conference at St. Petersburg have been marked, says *Engineering*, by an acrimonious discussion between the representatives of the older Ural establishments and the newer ones in the Baltic provinces and South Russia. The former date from the time of Peter the Great, when that monarch, by generous and well-directed state support, gave such an impulse to the charcoal iron trade that Russia became the leading iron-producing country in Europe. For a considerable period pig-iron was one of the principal products Russia exported to this country. In the beginning of the century, however, mineral coal began to prove a formidable competitor to charcoal in smelting-operations; and ultimately the tables were turned, and Russia received most of her iron from England, instead of supplying her with it. This revolution was marked by the collapse of the Ural iron industry, the ruin of which was accelerated by the wasteful destruction of the forests, and the extravagance of descendants of the iron-masters enriched by the support of Peter the Great. Twenty years ago the Russian government wanted to encourage the manufacture of rails, etc., for the home railways, and, finding the Ural firms disorganized and ruined, created a new industry at St. Petersburg, Briansk, etc., by giving large and lucrative contracts to a number of Russian and foreign capitalists. As coal and iron do not exist in the immediate vicinity of the Baltic, these new ventures were dependent upon foreign iron and coal for their sustenance, and have never been other than weaklings since their birth. The government is now tired of continually altering the tariff, and giving subsidies to these undertakings; and the attitude of neutrality it has taken up has had the effect of placing most of them more or less on the verge of ruin: hence the delegates representing them have been vehement in their demands for support; and, the support they want being precisely the opposite of that which would revive the Ural iron trade, the battle between the 'independent works' (i.e., using only Russian iron and fuel, as in the Urals) and the 'dependent works,' which cannot exist without foreign iron and coal, has been a tough one, accompanied by scenes of personal and undignified wrangling. It is hardly possible for the government to support one without injuring the other; and, as both are equally rotten, it is angrily disposed towards each of the industrial parties. Probably no branch of Russian trade has 'milked' the financial resources of the government more than the iron trade; and prosperity

and progress have attended so few of its efforts, that the government is almost tired of dispensing its support.

LONGEVITY.

It has been stated, with some degree of reason, says the *Lancet*, that the maximum age attainable by man has risen somewhat during the present century over that recorded in former ages. In judging of such statement, some allowance for error must be made. The exact statistical calculations of our day should not, in fairness, be marshalled against the round numbers of less accurate traditions. The fact remains, nevertheless, that the limit of seventy years is now very frequently passed. Fourscore may even be reached by some without excessive labor and sorrow, and we have among us nonagenarians who carry on with still respectable proficiency the activities of their prime. Such effective longevity is a bright spot in the history of our advancing civilization. Its comparative frequency, and its association with different physical types, suggest a certain generality in its origin, and encourage the hope that it may be, in some measure at least, dependent on personal conduct. It has been stated that no such condition can influence the length of life after middle age. After that period, inherited vital force is the only potential factor. To some extent this may be granted. If we fix an average of conduct, and suppose that a number of persons conform to it, we should certainly find the purest and most powerful constitutional types outlive the others. For instance: a gouty tendency does not enhance the prospects of old age. A rheumatic one is little better in this respect. The scrofulous are heavily weighted in the race of life by the chances of several infirmities. Nervous persons, again, are wiry, and may live through much trouble in virtue of their elastic tenacity. Then there are nondescript diatheses, which, except in their remote history, present no definite physical bias. Theoretically, these are most likely to furnish, under ordinary usages, the old men of a given time.

It will be at once evident, however, that these are general statements, and that an unlikely individual will often exceed his own expectation of life, and by care, or from the suitability of his circumstances, will reach old age. In weighing the value of constitutional tendencies, moreover, another nearly related quality should be considered. This is disposition. The mind of a man must be more or less of the nature of his body, and accordingly we expect to find, and do find, that mental habit reflects in preferences, varia-

tions, rate of action, and the like, the type of processes in the lower tissues. So far disposition is merely a part of constitution; and cheerfulness, hope, apathy, or gloom are only expressions of physical change. That all such qualities react upon the body in such a way as to influence its vitality, is undoubted. On the other hand, they may certainly be overruled by the action of the will, so as to be no longer mere bodily impulses, but trained servants of a governing intellect. They may thus acquire a compensatory value in correcting faults of constitution, and strengthen in proportion the tenure of life.

This brings us to the sphere of intelligent effort. There can be no doubt, in our opinion, that there is much room for exercise of private judgment and energy in seeking the prolongation of one's own life. If there is any known diathetic fault, this implies a law of one's being which will repay in a gain of vitality the man who recognizes it, and guides himself accordingly. The doctrine of the 'survival of the fittest' does not work itself out by blind chance, or without evident design, even among the lowest forms of life. Much less is it to be believed that man is unable so to adjust his circumstances to his needs as to continue to live after a certain mean period. The weaker will sometimes prove himself the more tenacious of life by observing rational methods of living, of which the more robust is careless. Moderation has probably more to do with success in this respect than any thing else. To eat sufficiently, and drink stimulants sparingly, to alternate work with adequate rest, and to meet worries heartily, will afford to every one the best chance of arriving at a ripe old age.

SOME interesting particulars of the German universities have recently been published by the *London illustrated news*. There are, it appears, twenty-nine now existing, including those in the Austrian empire and Switzerland, and the Russo-German university of Dorpat. Twelve have ceased to exist, with only one exception during the first sixteen years of the present century. The oldest is Prague (1348); the youngest, Czernowitz (1875). Six have been founded during the present century, among them four of the most important, — Berlin, Bonn, Munich, and Zurich. The number of students in the universities belonging to the German empire has risen from 14,808 in 1830, to 23,207 in 1883; but the percentage to the population is exactly the same. This percentage had declined very greatly during the intervening epoch, but has been rapidly recovering itself since the renovation of the German empire in 1871. The per-

centage of students of Catholic theology has declined during these fifty-three years from 12 to 3, mainly owing to the establishment of seminaries under direct Episcopal control. Protestant theology also exhibits a falling-off in percentage from 27 to 13, but the actual number of students is diminished only by a fourth. Jurisprudence has gained in number, but suffered in percentage. Medicine has more than doubled its numbers, and philosophy nearly quadrupled them, the percentage of the two united being 52, against 32 in 1830. The students of the exact sciences in the philosophical faculty are now 37 per cent, against 13 per cent in 1841.

It has been estimated, says the *New York medical record*, that one-half the adult men of American birth living in our cities are bald-headed. The estimate is not exaggerated, if it is applied to persons above the age of thirty, and it may be rather under the mark. If, now, it be conceded that one-half of our American business and professional men are bald at the present time, it would be interesting to speculate as to the condition of the heads of their descendants some hundreds of years from now. The probabilities point toward a race of hairless Americans, for baldness is extremely liable to be propagated in the male line, and to appear a little earlier in each generation. The American nation is threatened with the catastrophe of a universal alopecia. The cause is usually imputed to the excessive strain and ceaseless mental and physical activity to which our methods of business and modes of living conduce. From the visitors' gallery of the stock exchange, for example, one views a mob of shining pates, belonging, as a rule, to rather young men.

The much neglected scalp should be thoroughly cleansed at certain intervals. It should be carefully and regularly examined, and if it be unhealthy, dry, and scurvy, the proper applications should be made to it. The wearing of unventilated hats is one of the greatest sources of failure of nutrition of the hair, and these must be avoided. The beard never falls out, because it gets plenty of sunlight and air. These are what the hair of the scalp needs also. Women are less bald than men, because, for one reason, their scalps are better ventilated. In fine, civilization has made the hair-producing organs of the scalp delicate and feeble. They have to be nursed and cared for, or they atrophy and disappear. Young Americans who do not wish to lose their hair before they are forty must begin to look after their scalps before they are twenty.

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